AMENDMENTS TO THE CLAIMS

Claim 1 (Original) Tuneable laser apparatus comprising a tuneable laser, a thermal sensor and a controller, characterised in that said controller controls at least one or a combination of the following variables: the currents, the voltages, a tuning section and a phase section; and incorporates means which adjust any appropriate one or combination of said variables taking into account the laser's output wavelength dependency on temperature and section currents/voltage, whereby the output wavelength may be kept at the desired operating value without any significant mode jump whatever the temperature of operation within the laser's operative range.

Claim 2 (Original) Apparatus according to claim 1, comprising no closed loop laser temperature control means.

Claim 3 (Currently Amended) Apparatus according to ~~any preceding claim~~ claim 1, further comprising a low pass filter for removing rapidly changing signals in the control currents or voltages.

Claim 4 (Currently Amended) Apparatus according to ~~any preceding claim~~ claim 1, wherein the laser is a Distributed Bragg Reflector (DBR) tuneable laser diode.

Claim 5 (Currently Amended) Apparatus according to ~~any one of claims 1 to 3~~ claim 1, wherein the laser is a Distributed Feed Back (DFB) tuneable laser diode.

Claim 6 (Currently Amended) Apparatus according to ~~any one of claims 1 to 3~~ claim 1, wherein the laser is a Sampled Grating Distributed Bragg Reflector (SG-DBR) tuneable laser diode and the controller includes a processor programmed to follow the tuneability mapping of the two or more tuning section and/or phase section currents or voltages, and feeds control signals to those sections suitable to give the required wavelength.

Claim 7 (Currently Amended) Apparatus according to ~~any one of claims 1 to 3~~ claim 1, wherein the laser is a Super Structure Grating Distributed Bragg Reflector (SSG-DBR), tuneable laser diode and the controller includes a processor programmed to follow the tuneability mapping of the two or more tuning section and/or phase section currents or voltages, and feeds control signals to those sections suitable to give the required wavelength.

Claim 8 (Currently Amended) Apparatus according to ~~any one of claims 1 to 3~~ claim 1, wherein the laser is a vertical cavity filter laser and the controller includes a processor programmed to follow the tuneability mapping of the two or more tuning section and/or phase sections currents or voltages, and feeds control signals to those sections suitable to give the required wavelength.

Claim 9 (Currently Amended) Apparatus according to ~~any preceding claim~~ claim 1, wherein the apparatus incorporates a coolerless system associated with an optical phase lock loop (OPLL) to provide a frequency referenced coolerless laser diode.

Claim 10 (Currently Amended) Apparatus according to ~~any preceding claim~~ claim 1, wherein the apparatus incorporates a coolerless system associated with an optical injection phase lock loop system (OIPLL) to provide a frequency referenced coolerless laser diode.

Claim 11 (New) A tuneable laser apparatus comprising:

i) a tuneable laser comprising one or more sections, each said section being one of a tuning section, phase section and gain section; said one or more sections determining tuning characteristics of the laser according to a respective current/voltage applied thereto;

ii) a thermal sensor arranged to sense the laser temperature; and

iii) a controller for maintaining the laser's output wavelength at a required operating value independent of the laser temperature,

wherein the controller is arranged to: receive the laser temperature as an input value; determine the current/voltage to be applied to said one or more sections, based on the laser temperature and a predetermined trend defining a relation between the current/voltage and

temperature for the required output wavelength; and change the current/voltage applied to said one or more sections accordingly to maintain the laser's output wavelength at the required value without any significant mode jump.

Claim 12 (New) Apparatus according to claim 11, wherein, for a specified output wavelength value, the controller is arranged to receive the laser temperature as the sole variable input value.

Claim 13 (New) Apparatus according to claim 11, wherein, for a required output wavelength value, said relation is a function solely of temperature.

Claim 14 (New) Apparatus according to claim 11, wherein said predetermined trend is a quadratic relation.

Claim 15 (New) Apparatus according to claim 11, wherein said relation is defined by the longitudinal mode jump boundaries of a mapping of output wavelength with respect to the current/voltage applied to at least two of said sections.

Claim 16 (New) Apparatus according to claim 15, wherein said relation is further defined by the linear variation of output wavelength with temperature.

Claim 17 (New) Apparatus according to claim 11, comprising no closed loop laser temperature control means.

Claim 18 (New) Apparatus according to claim 11, wherein the laser is a Distributed Bragg Reflector (DBR) tuneable laser diode.

Claim 19 (New) Apparatus according to claim 11, wherein the laser is a Distributed Feed Back (DFB) tuneable laser diode.

Claim 20 (New) Apparatus according to claim 11, wherein the laser is a Sampled Grating Distributed Bragg Reflector (SG-DBR) tuneable laser diode and the controller includes a processor programmed to follow the tuneability mapping of the two or more tuning section and/or phase section currents or voltages, and feeds control signals to those sections suitable to give the required wavelength.

Claim 21 (New) Apparatus according to claim 11, wherein the laser is a Super Structure Grating Distributed Bragg Reflector (SSG-DBR), tuneable laser diode and the controller includes a processor programmed to follow the tuneability mapping of the two or more tuning section and/or phase section currents or voltages, and feeds control signals to those sections suitable to give the required wavelength.

Claim 22 (New) Apparatus according to claim 11, wherein the laser is a vertical cavity filter laser and the controller includes a processor programmed to follow the tuneability mapping of the two or more tuning section and/or phase sections currents or voltages, and feeds control signals to those sections suitable to give the required wavelength.

Claim 23 (New) Apparatus according to claim 11, wherein the apparatus incorporates a coolerless system associated with an optical phase lock loop (OPLL) to provide a frequency referenced coolerless laser diode.

Claim 24 (New) Apparatus according to claim 11, wherein the apparatus incorporates a coolerless system associated with an optical injection phase lock loop system (OIPLL) to provide a frequency referenced coolerless laser diode.